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CLAIMS

[Claim(s)]

[Claim 1] It is magnetic resonance imaging which carried out the interior of the device section which forms space in the lower part of the body of equipment, and connects a patient table to this space. Said device section It consists of a rotating jig attached in this free [rotation]. the fixture fixed to the steel pole of the body of equipment, and this fixture – Furthermore, by having a stop means to make a position stop said rotating jig, and the location detection section which sends a position signal in the location, and carrying out connection rotation of said patient table at said rotating jig Magnetic resonance imaging characterized by ON-coming out and carrying out this patient table from the many directions to opening of said body of equipment.

[Claim 2] Said stop means is magnetic resonance imaging according to claim 1 characterized by consisting of a crevice formed in the fixture so that it might fit into the projection and this which were prepared in the rotating jig.

[Claim 3] Said location detection section is magnetic resonance imaging according to claim 1 characterized by consisting of a pushdown switch formed in the appointed number place of a rotating jig, and a rotating jig which operates this switch in contact with this.

[Claim 4] Said location detection section is magnetic resonance imaging according to claim 1 characterized by consisting of the optical transmitter prepared in the fixture, its optical receiver formed in the griddle, and a rotating jig which interrupts the light from said optical transmitter.

[Translation done.]a

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the MRI equipment which enabled it to send in a patient table from two or more directions to an MRI body, in order to start the magnetic resonance imaging (MRI equipment) which gave a feeling of freedom to the subject by having large opening, and made access to the subject easy at the way person and to make access to a way person's subject still easier especially.

[0002]

[Description of the Prior Art] In recent years, as MRI equipment, a patient bed is made to appear from two or more directions in imaging volume ON, and the thing of a configuration of raising a magnetic resonance system throughput is indicated by U.S. Pat. No. 5,490,513. That is, two patient beds are prepared in it and the configuration which makes two patients ****(ed) by these take out from a longitudinal direction to magnetic imaging volume ON, respectively is shown. Furthermore, the configuration in which four sets of the handling systems which ****(ed) four patients, respectively are made to take out from four directions to imaging volume ON is shown.

[0003]

[Problem(s) to be Solved by the Invention] In order that the above-mentioned conventional technique may raise a system throughput, two sets or four beds are equipped to imaging volume, and the direction of the ON appearance to the imaging volume of these beds is always fixed. Therefore, it was fixed and the space for access to a way person's patient was not taken into consideration about correspondence of interventional radiology (IVR).

[0004] This invention equips one bed, constitutes this bed pivotable to opening of an MRI body, and from two or more directions, ON, as it is made to take out, the free space to a way person's patient is secured widely, and it aims a bed opening at making IVR easier.

[0005]

[Means for Solving the Problem] The purpose of this invention is attained by the following solution means. It is magnetic resonance imaging which carried out the interior of the device section which forms space in the lower part of the body of equipment, and connects a patient table to this space. The device section It consists of a fixture fixed to the steel pole of the body of equipment, and a rotating jig attached in this free [rotation]. Furthermore, by this device section's having a stop means to make a position stop said rotating jig, and the location detection section which sends a position signal in that location, and carrying out connection rotation of the patient table at a rotating jig It is characterized by ON-coming out and carrying out this patient table from the many directions, to opening of the body of equipment.

[0006] Said stop means consists of a crevice formed in the fixture so that it might fit into the projection and this which were prepared in the rotating jig. Said location detection section consists of a pushdown switch formed in the appointed number place of a rotating jig, and a rotating jig which operates this switch in contact with this. Furthermore, said location detection section may consist of rotating jigs which interrupt the light from the optical transmitter prepared in the fixture, its optical receiver formed in the griddle, and said optical transmitter.

[0007]

[Embodiment of the Invention] Hereafter, the example of this invention is explained according to an accompanying drawing. Drawing 1 is the external view of MRI equipment, and 1a and 1b are the steel poles arranged at right and left. 2a and 2b are the griddles which the steel poles 1a and 1b set up and down, and were held. 3a and 3b are the super-conductive magnets or permanent magnets which were fixed to griddle 2a and 2b, respectively. 4a and 4b are the base materials for supporting Magnets 3a and 3b. 5a and 5b are

openings which have the static magnetic field space B0 formed by said magnets 3a and 3b which counter and base materials 4a and 4b of those, and opening of the front face and rear face of equipment is carried out. 6 is a patient table which has a top plate 7, and builds in the motor for ON-appearing in Openings 5a and 5b, and using the motor and top plate 7 for moving a top plate 7 up and down as them.

[0008] In this invention, ON appearance of one patient table 6 is made possible, and it consists of [as opposed to / front opening 5a] three directions possible [ON appearance] from three directions further also as opposed to opening 5b on the back.

[0009] Drawing 2 is the approximate account Fig. which saw connection of an MRI body and a patient table from the top. The patient table 6 is arranged in the location P1 on the line L2 which intersects perpendicularly with the line L1 which connects the core of the steel poles 1a and 1b and griddle 2a, and passes along the core of griddle 2a, and it ON-appears in front opening 5a, and is made to set this to it. To front opening 5a, the patient table 6 is moved to the circumferencial direction of an MRI body, and it constitutes so that it may change to the locations P2 and P3 of ± 45 degrees and may connect to a line L2. Moreover, the patient table 6 arranged in the location P4 on a line L2 is moved to the locations P5 and P6 of ± 45 degrees to a line L2, and it changes, and is made to connect to rear-face opening 5b similarly.

[0010] Thus, by changing one patient table 6 to locations P1-P6, and connecting, free space is secured greatly, and it constitutes so that access to a way person's patient may be made easy. For example, when the patient table 6 is in locations P2, P3, P5, or P6, since one side of the patient table 6 will be opened 135 degrees, free space becomes large.

[0011] Drawing 3 shows the configuration of the gradient coil to each locations P1-P6 of the patient table 6 of drawing 2. In accordance with the vertical axes L3, x-axis inclination magnetic field 31x are prepared in the insulating disk 30, and y-axis inclination magnetic field 31y is formed in it in accordance with the shaft L4 which intersects perpendicularly with vertical axes L3 further. X-axis gradient coil 32x and y-axis inclination coil 32y are prepared in the location

moved to the electric insulating plate 32 which laps with this disk 30 45 degrees to said gradient coils 31x and 31y, respectively. Furthermore, the insulating disk 34 is arranged so that it may lap with disks 30 and 32, and common z-axis inclination magnetic field 33z is prepared in this to gradient coils 31x and 31y, and 32x and 32y.

[0012] Drawing 4 is the front view of the MRI body seen from the front opening 5a side. Disks 30, 32, and 34 are good to carry out interior to lower magnet 3b in piles. Space 40 is formed between lower griddle 2b and a floor, and the interior of the device section 41 for changing the patient table 6 into this space 40, and connecting is carried out.

[0013] Drawing 5 is the top view showing a part of this device section 41. Corresponding to the locations P1-P6 of the patient table 6, the crevice 52 connected with a guide rail 51 is formed in the fixture 50 of a circular flat tip, respectively, and the patient table 6 is positioned by the crevice 52. Furthermore, the detection section 53 for detecting the location of the patient table 6 corresponding to each crevice 52 is formed in a fixture 50.

[0014] Drawing 6 is the top view in which mainly showing the device section 41 and showing the rotating jig with which it equipped free [rotation] on the fixture 50. The rectangle-like rotating jig 60 is attached in a fixture 50 free [rotation] at the core O. Holes 61 and 62 are established in the both ends of a rotating jig 60, respectively. When the projections 63 and 64 always pressed by means of a spring are furthermore formed in the location corresponding to the crevice 52 of a fixture 50 in the both ends of a rotating jig 60 and these projections 63 and 64 fit into the crevice 52 of correspondence, it is made for a rotating jig 60 to stop in that location. That is, it considers as a stop means to make a position stop the patient table 6 by projections 63 and 64 and the crevice 52. Moreover, a cable 65 is connected to the cable 68 of a power source 67, also when an electrical cable 65 is arranged, the cable change terminal 66 is established in the center section and a rotating jig 60 rotates to a rotating jig 60. 69 is a connection fixture for connecting a rotating jig 60 and the patient table 6. The projection 691 inserted in the holes 61 or 62 of a rotating jig 60 is formed in the end of this fixture 69. Moreover, the projection 692 prepared at the tip of the

patient table 6 and the hole 693 which fits in are formed in the other end of a fixture 69. Moreover, the cable 695 linked to the cable 65 of a rotating jig 60 and the cable 694 of the patient table 6 is arranged in the connection fixture 69. It is good to use a connector as a cable comrade's connecting means. The cable 694 of the patient table 6 is connected to the motor (not shown) to which Openings 5a and 5b are made to take out the motor (not shown) and top plate 7 which are made to move the top plate 7 which carried out interior to the patient table 6 up and down ON.

[0015] Drawing 7 is a fragmentary sectional view for explaining said stop means concretely. The slot 51 connected with the crevice 52 of a fixture 50 is formed in the loose slope. The projection 63 (64) attached on the other hand so that it might always be pressed by the rotating jig 60 with a spring 71 fits into a crevice 52, and a rotating jig 60 is made to be stopped in this location. And when a rotating jig 60 rotates, on the turning effort, projection 52 slips out from a crevice 52, and it is constituted so that it may slide on the flat-surface top of a fixture 50 through the slot 51 on the slope and may fit into the crevice of other requests.

[0016] Drawing 8 shows the example of the detection section 53 of drawing 5, lays a pushdown switch 80 under the predetermined part of a fixture 50, and when a rotating jig 60 rotates and a pushdown switch 80 is operated, it sends out a position signal from the signal transduction cable 81.

[0017] The interior of the device section 41 which consists of a fixture 50 constituted as mentioned above and a rotating jig 60 is carried out to the space 40 shown in drawing 4. In this case, **** of a fixture 50 is fixed to the bottom wall of the steel poles 1a and 1b, and a rotating jig 60 does as a fixture 50 and griddle 2b, and it is made to rotate a fixture 50 top.

[0018] Drawing 9 shows other examples of the detection section 53, forms the optical transmitter 90 in the predetermined part at a fixture 50, and on the other hand, when the optical receiver 91 is formed in the part corresponding to the optical transmitter 90 at griddle 2b and a rotating jig 60 interrupts luminescence from the optical transmitter 90, it sends the location detecting signal of a rotating jig 60 from the optical receiver 91.

[0019] Next, migration of the patient table 6 is explained. In drawing 2, the case

where the patient table 6 is moved to a location P2 from a location P1 is described. When the patient table 6 is in a location P1, it connects with a rotating jig 60 through the connection fixture 69, and the cable 694 is also connected to cables 695 and 65 through a connector, and the patient table 6 is further connected to the power source 67 through the change terminal 66. Moreover, gradient coils 31x, 31y, and 33z are chosen by the signal from the location detection section 53 (drawing 3). In this condition, MRI photography of the analyte ****(ed) by the top plate 7 is performed. From this condition, in order to move the patient table 6 to a location P2, an operator rotates the patient table 6 with hand control to a location P2. If it does so, since a rotating jig 60 will rotate counterclockwise, the projection 63 of the stop means of drawing 7 slips out from a crevice 52, and it slides on the top face of a fixture 50 through a slot 51, and fits into the crevice to a location P2, and rotation of the patient table 6 is stopped in this location P2. If a rotating jig 60 stops in a location P2, the location detection section 53 will operate and gradient coils 32x, 32y, and 33z will be chosen by the position signal. Moreover, even if the patient table 6 rotates, the cable 694 is connected to a power source 67 by the change terminal 66.

[0020] Next, in moving the patient table 6 to a location P4 from a location P2, an operator moves the patient table 6, and returns a rotating jig 60 to the original location P1, and demounts the patient table 6 and the connection fixture 69 from a rotating jig 60. An operator carries the patient table 6 and the connection fixture 69 to a location P4, first, connects the connection fixture 69 to a rotating jig 60, and connects the patient table 6 to the connection fixture 60 after that. In this case, a rotating jig 60 stops in a location P4 with a stop means, the detection section detects a location P4, and chooses gradient coils 31x, 31y, and 33z, and the cable 694 of the patient table 6 is connected to a power source 67 by the terminal 66.

[0021] In addition, although this invention showed the example which formed the connection fixture 69, the patient table 6 may be connected to the direct rotating jig 60, without using this. However, it is more desirable to use a switching jig 69, since it is necessary to make it the structure which makes it the structure which lengthens the tip of the patient table 6 in this case, or lengthens

the end connection of the table 6 of a rotating jig 50 and that extended part becomes obstructive, when a table 6 is demounted from a rotating jig 60.

[0022]

[Effect of the Invention] Since one patient table was constituted from many possible [in-and-out] to opening of an MRI body according to this invention as stated above, the free space of access to a way person's patient can be extended, and it can respond to IVR.

[Translation done.]